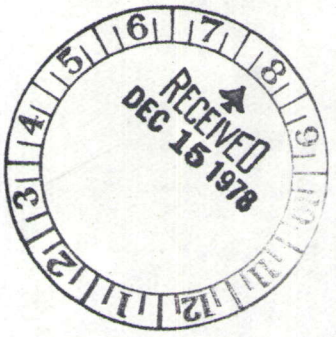
Received 12/14/78
RJD

FERTILIZER AND
MINING DIVISION

Stauffer CHEMICALS

Stauffer Chemical Company
Manila Star Route / Vernal, Utah 84078 / Telephone (801) 789-2233

November 15, 1978



State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining
1588 West North Temple
Salt Lake City, Utah 84116

Re: Addendum to Stauffer Chemical Company's Mining and Reclamation Plan submitted in June, 1977

Dear Sir:

On October 24, 1978, representatives of Stauffer Chemical Company briefly met with the members of the Board of Oil, Gas and Mining Division. The purpose of that meeting was to discuss the June 15, 1978, letter of commitment sent to all "Utah Mineral Operators" and find out how best to proceed in getting the Vernal Operation's Mining and Reclamation Plan approved as expeditiously as possible.

As a result of the meeting, Mr. Stewart suggested that Stauffer submit an addendum to the original plan for review. Rather than having to sign the June 15 letter of commitment, he said it would suffice if Stauffer addressed the M-10 standards in the addendum, pointing out how these standards will affect the mining operation in the foreseeable future. The attached addendum was prepared to comply with Mr. Stewart's recommendation.

It is important that Stauffer receive approval on the Vernal Mining and Reclamation Plan as soon as possible. Major capital expenditures are required if Stauffer is to continue mining phosphate at Vernal. The corporation, however, will not approve such expenditures without knowing exactly what will be expected in the future in terms of reclamation and subsequent reclamation costs.

Your assistance in helping Stauffer develop an approved Mining and Reclamation Plan as quickly as possible will be greatly appreciated. Stauffer will assist in any way possible to bring this project to a speedy conclusion.

Any questions concerning the Vernal Operation should be directed to Mr. Fred Riding, Manager - Vernal Operation, Phone No. (801) 789-2233.

Sincerely,

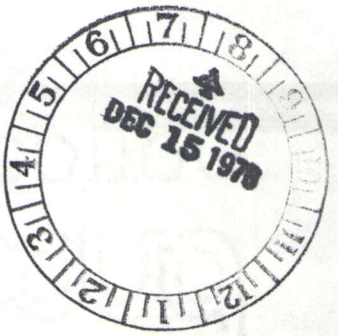
STAUFFER CHEMICAL COMPANY

Thomas J. Scheffel

Thomas J. Scheffel
Chief Engineer

TJS/jsa

Attachment



ADDENDUM TO THE MINING AND RECLAMATION PLAN FILED IN JUNE, 1977, BY STAUFFER CHEMICAL COMPANY

November 15, 1978

The purpose of this addendum is to address the changes and additions to the General Rules and Regulations adopted by the Board of Oil, Gas and Mining on March 22, 1978. It is also intended to serve as Stauffer Chemical Company's response to MR Form 8 sent to Stauffer on June 15, 1978.

The Vernal Operation is unique in many aspects. Subsequently, site-specific variances to the M-10 standards must be obtained if this mine is to remain competitive. Variances to rule M-10, subparts 2, 3, 4, 5, 7, 8, 12, and 13 are requested. An explanation concerning this request appears at the end of the following discussion.

Background Information

The Vernal property consists of 15,245 acres, more or less, of privately held land. Stauffer, through patented mining claims, holds the mineral rights to over 90% of the property.

Numerous erosional gullies and gulches cut across the property, creating very rugged topographic features. With the exception of some of the deeper drainages, the entire property contains a relatively low-grade, flatly dipping, bedded phosphate deposit. The phosphate bed is of uniform thickness and continuity and dips 5% to 15% in a southerly direction. Stratigraphically, it lies atop the massive Weber Sandstone and is overlain by varying thicknesses of limestone and limey sandstone overburden, locally referred to as the upper and lower cliff-formers. Many of the drainages cut deeply enough into the overlying structures to expose the phosphate bed. It is along these outcrops and adjacent low-overburden areas that current mining is centered.

At the present rate of production, the life expectancy of this mine is in excess of 500 years.

Open pit mining techniques are used in mining the phosphate. Mining, as a general rule, occurs along the outcrops and in the low-overburden areas and progresses away from and up dip of the plant site. The overburden and ore are very competent. Both have to be drilled and blasted before they can be removed. A low stripping ratio as the result of selective open pit mining is the single most important factor that has enabled this mine to compete with the higher grade deposits mined by the other western phosphate mining companies.

Waste disposal areas are limited. Because of the extent of the phosphate mineralization and the need to keep waste haul distances short, it is necessary to fill some natural drainage areas with waste rock. Waste dump construction ultimately shifts to the mined out areas as they become available and can accommodate a dump without interferring with current or anticipated mining activity. When abandoned, the waste dumps are rounded off and stabilized by reducing all slopes to less than the angle of repose.

With annual precipitation in the neighborhood of 8.5 inches/year, mined land erosion has not been a problem. Waste dump surfaces are stable at the angle of repose. Past experience has shown that the practice of filling the natural drainages with shot rock does not contribute to downstream pollution. These fills are, in fact, beneficial in reducing erosion and subsequent pollution in that they restrict the flow of water by temporarily backing it up and letting it slowly percolate and filter through. They, in essence, act as self-draining, sediment catch basins.

Haulroads, in practically all cases, are built across mined land. These are well maintained and self-draining. The likelihood of having to use these roads in the future to get at the remaining ore reserves dictates that some of them remain in useable condition. These are, however, left in a stable, but unvegetated condition.

Generally speaking, mining activity is concentrated and the phosphate deposit is developed in a systematic fashion. Economics is the controlling factor in establishing the sequence in which major areas of the property should be mined. The duration of each major area of concentrated activity is usually in excess of 10 years.

The ore is low-grade and needs to be beneficiated by mill flotation. Currently, the Vernal Mine is the only western phosphate mining operation successfully using this means of beneficiation.

Tailings disposal areas are limited, especially when looking at a 500 year mine life. Facilities for this purpose must be located in the natural drainages and where future open pit mining is not likely. Tailings disposal on mined land is not feasible because these lands are underlain by a dipping slick-rock surface (Weber Sandstone), an unstable base for this purpose. Stauffer is currently operating its tailing disposal facility under a no-discharge permit issued by the EPA.

Stauffer is already actively involved with mined land reclamation at the Vernal property. Major dumps, established prior to the passage of the 1975 Utah Mined Land Reclamation Act, have already been reshaped to stabilize them and improve their appearance. Some limited seeding has also been done. Recently, the company entered into a research program with the Soil Conservation Service in an attempt to establish the best means of revegetating the reshaped dumps and satisfying post mining requirements.

Ultimately, it is conceivable that the entire area covered by the patented mining claims will be disturbed as the result of mining activity, the only exceptions being Big Brush Creek Gorge and Little Brush Creek which flow water year around. Restoring the mined land to its original,

or near original, contour is not practical because the existing terrain is too rugged. This approach would result in extensive erosion and downstream pollution. At best, the land can be restored to have the characteristics of a rolling hill topography, intermingled with slick-rock surfaces and pit highwalls.

Future Mining Plans

Phosphate ore is currently being mined along the northwest extension of the low-overburden area west of Brush Creek. At the present rate of production, these reserves will last approximately two more years. Within this two year period, mining activity must begin shifting to the low-overburden area on the east side of Brush Creek. The above mentioned mining areas are high-lighted in green on attached drawing #31-200A.

Stauffer proposes to cross Brush Creek, which flows water year around, via a major bridge to be constructed just south of the mouth of Hole-in-the-Wall Canyon. The proposed bridge location is plotted on drawing #31-200A.

Since the ore outcrops along the sides of the drainage in this area, actual ore mining will begin once Brush Creek is crossed. Mining will proceed up dip and along the outcrops. Waste dumps will be constructed in the unmineralized drainages and on the mined land. Culverts will not be placed under or through any of the natural drainage fills. The waste rock is coarse enough to pass any anticipated runoff.

Haulroads will be constructed concurrently with mining where necessary to cross the mined-out or filled areas. A typical haulroad pattern that might result is illustrated on drawing #31-200A. Note that numerous crossings of the natural drainages will be necessary.

Highwalls along the pit limit will be retained as such in anticipation of the eventual return of mining to the area.

Other developmentsassociated with mining activity will be necessary: existing tailings disposal facilities will have to be increased in size and/or new disposal sites established; utilities will have to be expanded and/or, rerouted; and roads will have to be constructed.

After mining the low-overburden areas illustrated on drawing #31-200A, open pit mining will shift to other low-overburden areas east of State Highway 44 and/or to the high-overburden areas closer to the plant, both east and west of Brush Creek. Ultimately, the entire property will be mined jumping from major area to major area. The same general mining procedure as discussed earlier will be used to develop each of these areas.

Future economic conditions will dictate the development of the Vernal phosphate property. An increase in open pit mining activity and the subsequent expansion of the beneficiation facilities are likely to occur. It is conceivable that a new and completely independent mill could be built elsewhere on the property, nearer the source of ore.

Reclamation of the waste rock dumps will be done within 2 years after their complete abandonment. This will be done in accordance with an approved reclamation plan. The slick-rock footwalls and highwalls resulting from mining cannot be revegetated. They will be left as is. Temporarily abandoned haulroads will be left in a stable, but unvegetated state. Those haulroads having no further use and being constructed across mined waste will be reclaimed according to an approved reclamation plan.

Variances Sought

Stauffer Chemical Company believes a variance is justified on a site-specific basis for the following subsection of rule M-10. A brief description as to the extent of the variance requested and the reason for said variance is also noted.

A. Rule M-10-2(e)

Stauffer requests complete deletion of this subsection as it it not practical to fence, berm, or barricade existing or future highwalls for the following reasons:

1) The tops of most of the highwalls are not accessible to the general public.
2) The entire Stauffer property is fenced and/or posted to keep out unauthorized personnel.
3) Because of the rugged terrain, the rims of some of the natural drainages are more hazardous than any anticipated highwall.

B. Rule M-10-3

Stauffer requests a variance to this subsection in regards to the present tailings pond. This facility is currently under a no-discharge permit issued by the EPA. If and when the dike is raised another 50' to 60', it may be possible to make the facility non-impounding at that time. However, approval for such change in current status will probably have to come from the EPA.

A variance or clarification to this subsection is also requested in regards to making structures non-impounding. In order to mitigate erosion after a structure has been abandoned, it is necessary to have that structure impound some water, if only on a temporary basis until it has time to self-drain.

C. Rule M-10-4

Stauffer requests that the Division of Oil, Gas and Mining relinguish its option to dictate the slope angles required for fills that have slopes less than or equal to the angle of repose. Experience has shown that angle of repose slopes at this mine are stable and their contribution to mined land erosion is nil becuase of the limited amount of annual precipitation. In some areas, such major gully fills, tailings dikes, etc. where the fill is deep and/or narrow, it is not feasible to reduce slopes to less than the angle of repose. As a general rule, however, mine dumps will be rounded off to less than the angle of repose to assist in the revegetation process.

D. Rule M-10-5

Stauffer requests to not be held to reducing highwalls to a slope angle of 45^{0} or less or having to backfill against them. All existing or anticipated highwalls are or will be of competent rock. Also, these areas must be left exposed in anticipation of their return to active mining status in the future. The highwalls present no more a safety hazard than the rims of some of the natural drainages that transverse the property.

E. Rule M-10-7

Stauffer requests to be allowed to leave restricted drainage crossing as such upon abandonment of any road. Experience has shown that these restrictions are benficial in decreasing downstream erosion by restricting the velocity of the run-off and by acting as self-draining sediment catch basins.

F. Rule M-10-8

Stauffer requests a variance to the provisions of this entire subsection. The phosphate deposit at this mine outcrops along the edges and in the bottom of some of the natural channels. It is along these outcrops and through the adjacent low-overburden areas that mining occurs. The low stripping ratio as the result of mining in and along these drainages is the single most important factor that enables this mine to compete with much higher grade western phosphate mines.

Ultimately, the entire property will be mined, mostly by open pit methods. As a result, practically every natural drainage feature that is on the property will be disrupted. Stauffer, however, does not intend to disrupt those natural channels that contain water on a year around basis unless absolutely necessary; at that time, Stauffer will seek the necessary permits.

The lack of unmineralized waste disposal areas as a result of the extensive phosphate mineralization and the need to keep waste haul distances short makes it necessary to fill some of the natural channels with waste rock. Past experience has shown that this practice does not contribute to downstream pollution, but helps mitigate it. Also, reclaiming the land to have features characteristic of a rolling hill topography requires some filling of drainages so that they will blend in with the reshaped dumps.

Removing a fill from a natural drainage is not practical at the Vernal operation. The terrain is very rugged. Developing access to the bottom of filled drainages for the purpose of removing the fill will create disturbances that are even less desirable than the filled drainage itself.

G. Rule M-10-12

Stauffer requests to be exempted from having to establish a self-sustaining vegetative cover on all disturbed areas other than mine dumps and fills, specifically. The highwalls and adjacent slick-rock footwall are stable and cannot be revegetated. The meager amount of soil that can be removed and stockpiled prior to mining needs to be spread over dump and fill slopes to enhance vegetation success in these areas. There is not enough soil available to adequately cover all of the disturbed areas.

Stauffer, also, requests to be exempted from having to provide a surface cover representative of the communities surrounding the mine. Less than 10% of the undisturbed land is covered by vegetation; of this, over 80% is juniper trees. Junipers are not compatible with the post-mining use of the land, which will be privately owned rangeland. They are also very difficult to establish. Currently, the Soil Conservation Service is involved in a research program to determine exactly what will best grow on the waste dumps and satisfy the post mining vegetative requirements. The types and rates of seed that will be used for revegetation purposes will not be known until the results of this research program are reviewed.

H. Rule M-10-13

Stauffer requests that the present tailings pond be classified as an impounding facility. The tailings pond is currently covered by a no-discharge permit issued by the EPA.